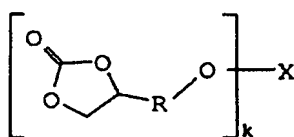
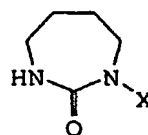


Patent claims

1. A process for modifying a substrate which has functional groups which are selected from hydroxyl groups and primary and secondary amino groups, in which at least one substrate is brought into contact with a compound of the formula I or II under conditions such that the functional groups react, with opening of the 1,3-dioxolane ring or 1,3-diazaheptane ring and formation of a covalent bond, with the compound of the formula I or II



I



II

in which

R is C<sub>1</sub>-C<sub>12</sub>-alkylene;

if k is 1, X is CO-CH=CH<sub>2</sub>, CO-C(CH<sub>3</sub>)=CH<sub>2</sub>, CO-O-aryl, C<sub>2</sub>-C<sub>6</sub>-alkylene-SO<sub>2</sub>-CH=CH<sub>2</sub> or CO-NH-R<sup>1</sup>; and

R<sup>1</sup> is C<sub>1</sub>-C<sub>30</sub>-alkyl, C<sub>1</sub>-C<sub>30</sub>-haloalkyl, C<sub>1</sub>-C<sub>30</sub>-hydroxyalkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy-C<sub>1</sub>-C<sub>30</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkylcarbonyloxy-C<sub>1</sub>-C<sub>30</sub>-alkyl, amino-C<sub>1</sub>-C<sub>30</sub>-alkyl, mono- or di(C<sub>1</sub>-C<sub>6</sub>-alkyl)amino-C<sub>1</sub>-C<sub>30</sub>-alkyl, ammonio-C<sub>1</sub>-C<sub>30</sub>-alkyl, polyoxyalkylene-C<sub>1</sub>-C<sub>30</sub>-alkyl, polysiloxanyl-C<sub>1</sub>-C<sub>30</sub>-alkyl, (meth)acryloyloxy-C<sub>1</sub>-C<sub>30</sub>-alkyl, sulfono-C<sub>1</sub>-C<sub>30</sub>-alkyl, phosphono-C<sub>1</sub>-C<sub>30</sub>-alkyl, di(C<sub>1</sub>-C<sub>6</sub>-alkyl)phosphono-C<sub>1</sub>-C<sub>30</sub>-alkyl, phosphonato-C<sub>1</sub>-C<sub>30</sub>-alkyl, di(C<sub>1</sub>-C<sub>6</sub>-alkyl)phosphonato-C<sub>1</sub>-C<sub>30</sub>-alkyl or a saccharide radical and,

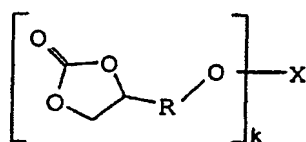
if k is an integer of more than 1, X is (i) the radical of a polyamine to which the moiety in brackets in the formula is bonded via (CO)NH groups, or (ii) a polymeric skeleton to which the moiety in brackets in

the formula is bonded via (CO), NH-C<sub>2</sub>-C<sub>6</sub>-alkylene-O-(CO) or (CO)-O-C<sub>2</sub>-C<sub>6</sub>-alkylene-O(CO) groups.

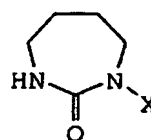
- 5 2. The process as claimed in claim 1, the substrate being selected from biomolecules, polymers or surfaces.
3. The process as claimed in claim 2, the substrate being a polymer.
- 10 4. The process as claimed in claim 3, in the compound of the formula I or II X being CO-NH-R<sup>1</sup> and at least some of the radicals R<sup>1</sup> being ammonioalkyl.
- 15 5. The process as claimed in claim 4, some of the radicals R<sup>1</sup> being radicals differing from ammonioalkyl.
- 20 6. The process as claimed in claim 1, the compound of the formula I or II being brought into contact with a first substrate under conditions such that a covalent bond forms between a first end of the compound of the formula I or II and the first substrate, and the reaction product being brought into contact with a second substrate under conditions such that a covalent bond forms between a second end of the compound of the formula I or II and the second substrate.
- 25 7. The process as claimed in claim 6, the first and/or second substrate being selected from biomolecules, polymers or surfaces.
- 30 8. The process as claimed in claim 7, the polymer being selected from polyalkyleneamines, polyvinylamine, polyallylamine, polyethylenimine, chitosan, polyamide/epichlorohydrin resins, polyaminostyrene, peptides or proteins.
- 35

9. The process as claimed in any of the preceding claims, the compound of the formula I being selected from  
 4-phenyloxycarbonyloxymethyl-2-oxo-1,3-dioxolane,  
 4-(4-phenyloxycarbonyloxy)butyl-2-oxo-1,3-dioxolane,  
 2-oxo-1,3-dioxolan-4-ylmethyl acrylate,  
 2-oxo-1,3-dioxolan-4-ylmethyl methacrylate,  
 4-(2-oxo-1,3-dioxolan-4-yl)butyl acrylate,  
 4-(2-oxo-1,3-dioxolan-4-yl)butyl methacrylate,  
 4-(vinylsulfonylethoxy)butyl-2-oxo-1,3-dioxolane.

10. A compound of the formula I or II



I



II

in which R is C<sub>1</sub>-C<sub>12</sub>-alkylene;

if k is 1, X is C<sub>2</sub>-C<sub>6</sub>-alkylene-SO<sub>2</sub>-CH=CH<sub>2</sub> or CO-NH-R<sup>1</sup>;

and R<sup>1</sup> is C<sub>1</sub>-C<sub>30</sub>-alkyl, C<sub>1</sub>-C<sub>30</sub>-haloalkyl, C<sub>1</sub>-C<sub>30</sub>-hydroxyalkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy-C<sub>1</sub>-C<sub>30</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkylcarbonyloxy-C<sub>1</sub>-C<sub>30</sub>-alkyl, amino-C<sub>1</sub>-C<sub>30</sub>-alkyl, mono- or di(C<sub>1</sub>-C<sub>6</sub>-alkyl)amino-C<sub>1</sub>-C<sub>30</sub>-alkyl, ammonio-C<sub>1</sub>-C<sub>30</sub>-alkyl, polyoxyalkylene-C<sub>1</sub>-C<sub>30</sub>-alkyl, polysiloxanyl-C<sub>1</sub>-C<sub>30</sub>-alkyl, sulfono-C<sub>1</sub>-C<sub>30</sub>-alkyl, phosphono-C<sub>1</sub>-C<sub>30</sub>-alkyl, di(C<sub>1</sub>-C<sub>6</sub>-alkyl)phosphono-C<sub>1</sub>-C<sub>30</sub>-alkyl, phosphonato-C<sub>1</sub>-C<sub>30</sub>-alkyl, di(C<sub>1</sub>-C<sub>6</sub>-alkyl)phosphonato-C<sub>1</sub>-C<sub>30</sub>-alkyl or a saccharide radical and,

if R is C<sub>2</sub>-C<sub>12</sub>-alkylene, X may also be CO-aryl, CO-CH=CH<sub>2</sub>, CO-C(CH<sub>3</sub>)=CH<sub>2</sub> or (meth)acryloyloxy-C<sub>1</sub>-C<sub>30</sub>-alkyl-NH-CO,

or if k is an integer of more than 1, X is the radical of a polyamine to which the moiety in brackets in the

formula is bonded via (CO)NH groups.

11. The compound as claimed in claim 10, in which  $R^1$  is

-  $(CH_2)_n-CH_3$ ,

-  $(CH_2)_n-(CF_2)_m-CF_3$ ,

-  $(CH_2)_n-[Si(CH_3)_2-O]_p-H$ ,

-  $(CH_2)_n-Si(OSi(CH_3)_3)_3$ ,

-  $(CH_2)_n-(O-CH_2-CHR^4)_p-OR^3$ ,

-  $R^2-OH$ ,

-  $R^2-NH_2$ ,

-  $R^2-NR^3_3^+Y^-$ ,

-  $R^2-SO_3H$ ,

-  $R^2-PO_3H_2$ ,

-  $R^2-OPO_3H_2$

or a saccharide radical,

$R^2$  being  $C_1-C_{18}$ -alkylene,  $R^3$  being  $C_1-C_{18}$ -alkyl or benzyl and  $R^4$  being hydrogen or methyl,

$Y$  being one equivalent of an anion,

$n$  and  $m$  independently of one another, being an integer from 0 to 12; and

$p$  being an integer from 1 to 100.

12. The compound as claimed in claim 10, selected from  
4-(4-phenyloxycarbonyloxy)butyl-2-oxo-1,3-dioxolane,

2-oxo-1,3-dioxolan-4-ylmethyl acrylate,

2-oxo-1,3-dioxolan-4-ylmethyl methacrylate,

4-(2-oxo-1,3-dioxolan-4-yl)butyl acrylate,

4-(2-oxo-1,3-dioxolan-4-yl)butyl methacrylate,

4-(vinylsulfonylethoxy)butyl-2-oxo-1,3-dioxolane.

13. A modified polymer obtainable by the process as claimed in any of claims 3 to 5.

14. The use of the modified polymer as claimed in claim 13 as a finish, dispersant, emulsifier, adhesion promoter, adhesive or contact adhesive, for modifying surfaces or for immobilizing active substances.